

REMARKS

Claims 1-20 are pending in the present application. Claims 2, 4, and 13, are amended. Claims 16-20 are added. Reconsideration of the claims is respectfully requested.

I. 35 U.S.C. § 102, Anticipation

The Office Action rejects claims 1, 3, 5, 7-9, and 12-15 under 35 U.S.C. § 102 as being anticipated by Furusho et al. (US Patent No. 6,310,604), hereinafter referred to as "*Furusho*." This rejection is respectfully traversed.

As to claim 1, the Office Action states:

Regarding claim 1, Furusho discloses a keyboard (see Column 16, Lines 20-27) apparatus comprising: a fabric [Fig. 17, 105] (see Column 14, Lines 22-35); a plurality of switch units [Fig. 19, 2] coupled to the fabric, wherein each switch unit within the plurality of switch units includes: a capsule/sealed-unit containing an electrically responsive liquid [Fig. 19, 106], wherein the electrically responsive liquid causes the capsule to increase in rigidity/viscosity in response to application of an electric field to the electrically responsive liquid; a switch [Fig. 19, 2b] coupled to the capsule, wherein a selected pressure applied to the capsule activates the switch; and a plurality of electrical conducting lines [Fig. 19, 138] connected to the plurality of switch units (see Column 14, Line 66 - Column 15, Line 35).

Office Action, dated September 11, 2002. Applicant respectfully disagrees. *Furusho* teaches a virtual reality and telereality system including a teleexistence system including an electrode unit that allows a user to grasp a virtual object. See *Furusho*, **FIGS. 7, 8, 16, and 19**. However, *Furusho* does not teach or suggest a keyboard, as recited in claim 1.

The cited portion of *Furusho* states:

Furthermore, the force display device in accordance with the present invention serves as one of the fundamental techniques of multimedia utilizing high speed networks; it serves as an input/output device of an information terminal like a mouse, keyboard, display or speaker, thereby making it possible to transmit information on haptic senses such as touch, grasp or rub in addition to the conventionally transmitted information like characters, images or voices.

Furusho, col. 16, lines 20-27. In other words, the force display device of *Furusho* is **like**

a keyboard in that it is an input/output device. The force display device of *Furusho* makes it possible to transmit information on haptic senses such as touch, grasp or rub. However, the force display device of *Furusho* is not, itself, a keyboard.

Furthermore, *Furusho* teaches an electrically responsive liquid, wherein the electrically responsive liquid causes the capsule to increase in rigidity/viscosity in response to application of an electric field to the electrically responsive liquid. See *Furusho*, FIG. 19, 106. However, as clearly shown in FIG. 19, the electrically responsive liquid is not part of an individual capsule within an individual switch unit. In the *Furusho* device, there is one body that contains the electrically responsive liquid and all sensors and electrodes are coupled to that same body. Therefore, *Furusho* does not teach or suggest a **plurality** of **switch** units, wherein **each** switch unit includes “a capsule containing an electrically responsive liquid, wherein the electrically responsive liquid causes the capsule to increase in rigidity in response to application of an electric field to the electrically responsive liquid,” “a switch coupled to the capsule, wherein a selected pressure applied to the capsule activates the switch,” and “a plurality of electrical conducting lines connected to the plurality of switch units,” as recited in claim 1.

Still further, *Furusho* does not teach or suggest a plurality of switch units, wherein each switch unit includes “a switch coupled to the capsule, wherein a selected pressure applied to the capsule activates the switch,” as recited in claim 1. *Furusho* makes no mention of applying pressure to a capsule to activate a switch. In fact, the word “switch” does not even appear in *Furusho*. The container that holds the electrorheological fluid in *Furusho* is not a capsule and this container is not coupled to a switch. Moreover, *Furusho* does not teach or suggest that applying pressure to this container activates a switch.

The applied reference does not teach each and every claim limitation; therefore, claim 1 is not anticipated by claim 1. Independent claims 9 and 12 recite subject matter addressed above with respect to claim 1 and are allowable for the same reasons. Since claims 3, 5, 7, and 8 depend from claim 1, the same distinctions between *Furusho* and the invention recited in claim 1 apply for these claims. Additionally, claims 3, 5, 7, and 8 recite other additional combinations of features not suggested by the reference.

Consequently, it is respectfully urged that the rejection of claims 1, 3, 5, and 7-9 is overcome.

More particularly, claim 3, the Office Action states:

Regarding claim 3, Furusho discloses the liquid causes the capsule to expand when an electrical field is applied to the electrically responsive liquid (see Column 9, Lines 37-45).

Office Action, dated September 11, 2002. Applicant respectfully disagrees. The cited portion of *Furusho* states:

The electrorheological fluid 106 varies its viscosity in accordance with the intensity of the electric field. That is, the viscosity of the electrorheological fluid 106 filled in the space between the pins 104 and the holes 103 increases or decreases in response to the intensity of the electric field. Thus, the movement of the pins 104 can be freely controlled such as heavy or light movement by varying the flow resistance of the electrorheological fluid 106 with the electric field.

Furusho, col. 9, lines 37-45. Thus, *Furusho* teaches controlling the movement of pins by applying an electric field to the electrorheological fluid. However, nowhere does *Furusho* teach a capsule for each of a plurality of switch units, wherein an electrically responsive liquid causes the capsule to expand when an electrical field is applied, as recited in claim 3. *Furusho* does not teach that the container, in which the electrorheological fluid is held, is expandable. In fact, if the container in *Furusho* were expandable, then this would negate the control (heavy or light) of the pin movement. In other words, if the container in *Furusho* were allowed to expand, then this would work against controlling the flow resistance of the fluid. Therefore, *Furusho* does not teach or suggest “wherein the electrically responsive liquid causes the capsule to expand when an electrical field is applied to the electrically responsive liquid,” as recited in claim 3.

With respect to claim 5, the Office Action states:

Regarding claim 5, Furusho discloses the plurality of switches is coupled to the fabric by being embedded within the fabric (see Fig. 17; Column 14, Lines 22-35).

Office Action, dated September 11, 2002. Applicant respectfully disagrees. The cited

figure illustrates parallel electrodes. The cited portion of *Furusho* states:

In these figures, the thumb and fingers wear electrode units **150**, each of which comprises metallic film electrodes **138** and metallic parallel plate electrodes **139**. First ends of the metallic film electrodes **138** are connected to the backs of the fingers via metallic insulating portions **137**, and second ends thereof are deeply inserted into the spaces of the parallel plate electrodes **139**. The parallel plate electrodes **139** are provided with thin, insulating, synthetic nonwoven fabrics stuck to their surfaces which serve as spacers **105**. The spacers **105** insulate the metallic film electrodes **138** from the parallel plate electrodes **139**, and keep the spaces constant, as well. Furthermore, the electrorheological fluid **106** is filled in the spaces between the metallic film electrodes **138** and the parallel plate electrodes **139**.

Furusho, col. 14, lines 22-35. Thus, *Furusho* teaches a plurality of electrodes connected to the backs of fingers with nonwoven fabrics serving as spacers. However, *Furusho* does not teach or suggest “wherein the plurality of switches is coupled to the fabric by being embedded within the fabric,” as recited in claim 5. The Office Action does not address this feature other than to point to the above cited portion. The Office Action is silent as to how electrodes with fabrics serving as spacers, as taught by *Furusho*, are somehow equivalent to a plurality of switch units, wherein each switch unit includes a switch and wherein the plurality of switches is embedded within a fabric, as in the claimed invention. The applied prior art does not teach this feature; therefore, claim 5 is not anticipated by *Furusho*.

With reference now to claim 7, the Office Action states:

Regarding claim 7, *Furusho* discloses a number of the plurality of switch units have a different rigidity from the others in the plurality of switch units when an electric field is applied to the electrically responsive liquid (see Column 9, Lines 37-45).

Office Action, dated September 11, 2002. Applicant respectfully disagrees. Again, the Office Action refers to a portion of *Furusho* that teaches controlling the movement of pins by applying an electric field to the electrorheological fluid. However, the Office Action proffers no analysis as to why this is equivalent to a plurality of switch units,

wherein each switch unit includes a capsule containing an electrically responsive liquid, wherein the electrically responsive liquid causes the capsule to increase in rigidity in response to application of an electric field to the electrically responsive liquid, and “wherein a number of the plurality of switch units have a different rigidity from others in the plurality of switch units when an electric field is applied to the electrically responsive liquid,” as recited in claim 7. *Furusho* does not teach or suggest the switch units recited in claim 1; therefore, it follows that *Furusho* fails to teach or suggest the further limitation in claim 7, wherein the switch units have different rigidity depending upon an applied electric field. *Furusho* simply does not teach or suggest switch units that are capable of having differing rigidity. Thus, claim 7 is not anticipated by *Furusho*.

With respect to claim 13, the Office Action states:

Regarding claim 13, this claim is rejected by the reasoning applied in the above rejection of claim 1, furthermore *Furusho* discloses a pointing apparatus (see Column 16, Lines 20-28).

Office Action, dated September 11, 2002. Applicant respectfully disagrees. *Furusho* teaches a virtual reality and telereality system including a teleexistence system in which an electrode unit that allows a user to grasp a virtual object. See *Furusho*, **FIGS. 7, 8, 16, and 19**. However, *Furusho* does not teach or suggest a pointing device, as recited in claim 13. The cited portion of *Furusho* states:

Furthermore, the force display device in accordance with the present invention serves as one of the fundamental techniques of multimedia utilizing high speed networks; it serves as an input/output device of an information terminal like a mouse, keyboard, display or speaker, thereby making it possible to transmit information on haptic senses such as touch, grasp or rub in addition to the conventionally transmitted information like characters, images or voices.

Furusho, col. 16, lines 20-27. In other words, the force display device of *Furusho* is like a mouse in that it is an input/output device. The force display device of *Furusho* makes it possible to transmit information on haptic senses such as touch, grasp or rub. However, the force display device of *Furusho* is not, itself, a pointing device that one would normally associate with a graphical user interface of an operating system having icons,

etc. Moreover, the force display device of *Furusho* is not a pointing apparatus with switches, as recited in claim 13.

Furthermore, *Furusho* fails to teach or suggest “a capsule containing an electrically responsive liquid, wherein the electrically responsive liquid causes the capsule to increase in rigidity in response to application of an electric field to the electrically responsive liquid,” and “a plurality of switches coupled to the capsule, wherein a selected pressure applied to a portion of the capsule activates one or more of the plurality of switches,” as recited in claim 13. The applied prior art fails to teach or suggest each and every claim limitation; therefore, claim 13 is not anticipated by *Furusho*.

Since claims 14 and 15 depend from claim 13, the same distinctions between *Furusho* and the invention recited in claim 13 apply for these claims. Additionally, claims 14 and 15 recite other additional combinations of features not suggested by the reference.

More particularly, with respect to claim 14, the Office Action states:

Regarding claim 15, *Furusho* discloses the capsule being in the shape of a rectangle [Fig. 10, 116] (see Column 11, Lines 29-43).

Office Action, dated September 11, 2002. Applicant respectfully disagrees. The cited portion of *Furusho* states:

FIG. 10 is a schematic diagram showing a force display device used in EMBODIMENT 3 of a teleexistence system in accordance with the present invention. This embodiment is an example of a telereality system which operates a remote object with a robot grip. **FIG. 10** illustrates the operation principle of the force display device.

The telereality system employs a hydraulic system using the electrorheological fluid **106** as a circulating liquid to control the direction and force of the piston output by the intensity of the electric field applied to the electrorheological fluid **106**, thereby displaying the piston output to a manipulator on the operator side as a force sense. In **FIG. 10**, the electrorheological fluid **106** is controlled such that it flows out of a pump **114**, circulates the Wheatstone bridge **115**, and returns to a tank **116**.

Furusho, col. 11, lines 29-43. Clearly, this embodiment in *Furusho* does not teach or suggest a pointing device that comprises a fabric and a switch unit coupled to the fabric, wherein the switch unit includes a capsule containing an electrically responsive liquid, wherein the electrically responsive liquid causes the capsule to increase in rigidity in response to application of an electric field to the electrically responsive liquid, and a plurality of switches coupled to the capsule, wherein a selected pressure applied to a portion of the capsule activates one or more of the plurality of switches, as recited in claim 13. Therefore, it follows that neither the cited portion nor any other portion of *Furusho* teaches or suggests the further limitation in claim 15, wherein the capsule is in a shape of a rectangle.

Therefore, the rejection of claims 1, 3, 5, 7-9, and 12-15 under 35 U.S.C. § 102 is overcome.

Furthermore, *Furusho* does not teach, suggest, or give any incentive to make the needed changes to reach the presently claimed invention. Absent the Office Action pointing out some teaching or incentive to implement *Furusho* to make a keyboard or pointing device, one of ordinary skill in the art would not be led to modify *Furusho* to reach the present invention when the reference is examined as a whole. Absent some teaching, suggestion, or incentive to modify *Furusho* in this manner, the presently claimed invention can be reached only through an improper use of hindsight using the applicants' disclosure as a template to make the necessary changes to reach the claimed invention.

II. 35 U.S.C. § 103, Obviousness

The Office Action reject claims 2, 4, 6, 10, and 11 under 35 U.S.C. § 103 as being unpatentable over *Furusho*. This rejection is respectfully traversed.

Claims 2, 4, 6, 10, and 11 depend from claims 1 and 9; therefore, the same distinctions between *Furusho* and the invention recited in claims 1 and 9 apply for these claims. Thus, claims 2, 4, 6, 10, and 11 are allowable at least by virtue of their dependence on claims 1 and 9. Additionally, claims 2, 4, 6, 10, and 11 recite other additional combinations of features not suggested by the reference.

More particularly, with respect to claim 2, the Office Action states:

Regarding claim 2, *Furusho* does not expressly disclose a piezoelectric-sensitive component. However, the use of piezoelectric-sensitive components was well known and commonly understood in the field of switches, at the time of invention. Therefore, it would have been obvious to one skilled in the art at the time of invention to use a piezoelectric-sensitive component as *Furusho*'s switch, so as to accurately sense applied force.

Office Action, dated September 11, 2002. Applicant respectfully disagrees. As stated above, *Furusho* does not teach a plurality of switches, as particularly recited in claim 1. In fact, the word "switch" does not even appear in *Furusho*. Therefore it follows that the further limitation in claim 2 would not have been obvious given the teachings of *Furusho*.

With respect to claim 4, the Office Action states:

Regarding claim 4, *Furusho* does not expressly disclose an apron. However, the use of aprons was well known and commonly understood in the field of fabrics, at the time of invention. Therefore, it would have been obvious to one skilled in the art at the time of invention to use an apron with *Furusho*'s glove (see Column 2, Lines 10-15), so as to comfortably store the apparatus.

Office Action, dated September 11, 2002. Applicant respectfully disagrees. *Furusho* teaches a virtual reality and telereality system including a teleexistence system including an electrode unit that allows a user to grasp a virtual object. See *Furusho*, **FIGS. 7, 8, 16, and 19**. However, *Furusho* does not teach or suggest a keyboard, as recited in claim 1. Therefore, it follows that the further limitation in claim 2 would not have been obvious given the teachings of *Furusho*. More specifically, the applied reference does not teach or suggest a keyboard comprising a fabric and **a plurality of switch units coupled to the fabric**, "wherein the fabric is integrated within an article of wearing apparel," as recited in claim 4, as amended. The prior art fails to teach or fairly suggest each and every claim limitation; therefore, claim 4 is not rendered obvious by *Furusho*.

New claims 17 and 19 recite subject matter addressed above with respect to claim 4 and are allowable for the same reasons. Furthermore, new claims 16, 18, and 20 recite, "wherein the article of wearing apparel is one of an apron and a pair of pants." The prior

art does not teach or suggest this feature; therefore, claims 16, 18, and 20 are not rendered obvious by *Furusho*.

Further, with respect to claim 6, the Office Action states:

Regarding claim 6, *Furusho* does not expressly disclose a plurality of symbols in locations on the fabric identifying the plurality of switches. However, the use of identifying symbols was well known and commonly understood in the field of fabrics, at the time of invention. Therefore, it would have been obvious to one skilled in the art at the time of invention to use identifying symbols on *Furusho*'s glove, so as to assist the use in properly wearing (distinguishing between the left and right hand, for instance) and using the glove.

Office Action, dated September 11, 2002. Applicant respectfully disagrees. Again, the applied reference does not teach or suggest a keyboard comprising a fabric and a **plurality of switch units coupled to the fabric**. Therefore, it follows that *Furusho* does not teach or fairly suggest the further limitation of "wherein the fabric includes a plurality of symbols in locations on the fabric identifying the plurality of switches," as recited in claim 6. The Office Action does not address this limitation other than to conclude that the feature would have been obvious "so as to assist the use in properly wearing (distinguishing between the left and right hand, for instance) and using the glove." Symbols that distinguish between a right and left hand are not equivalent to symbols "identifying the plurality of switches." The Office Action may not make modifications to the prior art using the claimed invention as a model for the modifications. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780, 1783-1784 (Fed. Cir. 1992). "The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art has suggested the desirability of the modification." *Id.* In other words, unless some teaching exists in the prior art for the suggested modification, merely asserting that such a modification would be obvious to one of ordinary skill in the art is improper and cannot be used to meet the burden of establishing a *prima facie* case of obviousness. Such reliance is an impermissible use of hindsight with the benefit of applicant's disclosure.

Therefore, absent some teaching, suggestion, or incentive in the prior art, *Furusho* cannot be properly modified to form the claimed invention. As a result, absent any

teaching, suggestion, or incentive from the prior art to make the proposed modifications, the presently claimed invention can be reached only through the an impermissible use of hindsight with the benefit of applicant's invention as a model.

Therefore, the rejection of claims 2, 4, 6, 10, and 11 under 35 U.S.C. § 103 is overcome.

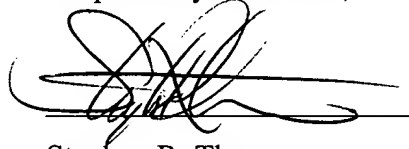
III. Conclusion

It is respectfully urged that the subject application is patentable over *Furusho* and is now in condition for allowance.

The Examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the Examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

DATE: Dec 11, 2002

Respectfully submitted,



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APPENDIX OF REDACTED CLAIMS

Please amend claims 2, 4, and 13 as follows:

2. (Amended) The keyboard apparatus of claim 1, wherein the switch is a [pizeoelectric-sensative] piezoelectric-sensitive component.

4. (Amended) The keyboard apparatus of claim 1, wherein the fabric is [a form of an apron] integrated within an article of wearing apparel.

13. (Amended) A pointing apparatus comprising:

a fabric; and

a switch unit coupled to the fabric, wherein the switch unit includes:

a capsule containing an electrically responsive liquid, wherein the electrically responsive liquid causes the capsule to increase in rigidity in response to application of an electric field to the electrically responsive liquid; and

a plurality of switches coupled to the capsule, wherein a selected pressure applied to a portion of the capsule activates one or more of the plurality of switches.

Please add the following new claims:

--16. (New) The keyboard apparatus of claim 4, wherein the article of wearing apparel is one of an apron and a pair of pants.

17. (New) The keyboard of claim 9, wherein the fabric is integrated within an article of wearing apparel.

18. (New) The keyboard of claim 17, wherein the article of wearing apparel is one of an apron and a pair of pants.

19. (New) The pointing apparatus of claim 13, wherein the fabric is integrated within an article of wearing apparel.

20. (New) The pointing apparatus of claim 19, wherein the article of wearing apparel is one of an apron and a pair of pants.--